UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte DAVID C. SCHWARTZ

Appeal 2007-1078
Application 09/638,102
Technology Center 1600

ON BRIEF

Before SCHEINER, ADAMS, and LEBOVITZ, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON APPEAL

Claims 41 and 43-52 are on appeal (Br. 2). We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

STATEMENT OF CASE

Claims 2, 5-7, 9-13, 14-33, 35, 41, and 43-52 are pending (Br. 2). Claims 2, 5-7, 9-13, and 35 are allowed (*id.*). Claims 14-33 are withdrawn from consideration (*id.*). Claims 41 and 43-52 stand finally rejected over prior art (*id.*).

The claimed invention relates to linear arrays of chemically reactive substances on slender strips (Specification 4: 7-8). The chemically reactive substances can be oligonucleotides (*id.* at 9: 11-13). Each strip can have a different array (*id.* at 4: 17). Subsets of different strips can be selected from a library of strips and combined in two-dimensional and three-dimensional arrays on a support frame (*id.* at 4: 22 to 5: 3) to create larger arrays of different chemically reactive substances (*id.* at 10: 6-28).

The Examiner relies on the following prior art as evidence of unpatentability:

Zuk et al. (Zuk)	U.S. Pat. No. 4,281,061	Jul. 28, 1981
Gross et al. (Gross)	U.S. Pat. No. 4,867,946	Sep. 19, 1989
Adams et al. (Adams)	U.S. Pat. No. 6,156,494	Dec. 5, 2000
Bentsen et al. (Bentsen)	U.S. Pat. No. 6,372,895	Apr. 16, 2002

Claims 41, 43, 45-46, and 48 stand finally rejected under 35 U.S.C. § 103(a) as obvious over Gross in view of Zuk (Br. 3). Claim 44 stands finally rejected under 35 U.S.C. § 103(a) as obvious over Gross in view of Zuk, and further in view of Adams (*id.*). Claims 49-52 stand finally rejected under 35 U.S.C. § 103(a) as obvious over Gross in view of Zuk, and further in view of Bentsen (*id.*).

For the purpose of deciding this appeal, we focus our attention on claim 41, which is the only independent claim on appeal. Claim 41 reads as follows:

41. A chemical screening kit comprising:

(a) a library of strips of a non-reactive substrate extending along a longitudinal axis, each strip supporting, spaced along that longitudinal axis, different linear arrays of chemically reactive substances exposed on a surface of the strip; and

(b) a support frame for receiving and holding different combinations of a subset of the library of strips for mutual exposure to a material to be screened;

whereby a semi-custom array of reactive substances may be created.

ISSUE ON APPEAL

The Examiner contends that the claimed chemical screening kit is obvious in view of Gross combined with other prior art references because Gross teaches test strips which contain "different linear arrays of chemically reactive substances" as required by claim 41 (Answer 3 and 6). Appellant contends that Gross teaches test strips, each having identical linear arrays, which do not meet the claimed limitation of "different linear arrays." (Br. 4.)

The issue in this appeal is whether Gross's test strips meet the claim 41 limitation of strips having "different linear arrays of chemically reactive substances," providing adequate disclosure to establish prima facie obviousness of the claimed subject matter.

CLAIM INTERPRETATION

A determination that a claim is obvious requires two steps. First, the claim language must be interpreted. Secondly, the properly interpreted claim is compared to the prior art and findings are made to determine whether the claimed subject matter is obvious in view of the cited prior art.

See In re Crish, 393 F.3d 1253, 1256, 73 USPQ2d 1364, 1366 (Fed. Cir. 2004).

Claim 41 is directed to a chemical screening kit that contains two components: a library of strips; and a support frame for receiving and holding the strips. At issue in this appeal is the proper interpretation of the phrase: "each strip supporting . . . different linear arrays of chemically reactive substances exposed on a surface of the strip." The Examiner interprets the phrase to mean that the linear array on a particular strip is comprised of different chemically reactive substances. Appellant, however, interprets the term "different" to apply to the strips, rather than to the linear array, itself. Under his interpretation, the linear arrays differ from strip to strip. Reading the claim in view of the specification as it would be understood by the skilled worker, we find that Appellant's interpretation is the most reasonable one.

The specification describes the invention as placing chemically reactive sampling compounds "in linear arrays on slender strips" which avoids the need for planar arrays (Specification 4: 7-8). "[I]t is one object of the invention to facilitate the screening of a chemical compound against large numbers of sampling compounds in an efficient and yet flexible way. Each strip may be manufactured in a batch including many other strips and, then separated from the batch and assembled to produce a variety of different arrays." (*Id.* at 4: 22-25.)

More specifically, the invention is described as providing "at least two different strips of a non-reactive substrate extending along a longitudinal axis and, supporting . . . a linear array of different chemically reactive

sampling compounds." (*Id.* at 4: 17-19.) Two examples of different kinds of strips are described in the specification. In the first, each strip has a linear array composed of different sampling compounds. The strips differ from each other by having different sampling compounds and/or by ordering the sampling compounds differently in each strip (*id.* at 8: 26 to 10: 17). Fig. 4 shows five strips, each supporting an array which differs in the identity and order of the sampling compounds. A second embodiment is shown in which each strip contains a linear array of the same sampling compound (*i.e.*, a particular cell type), but each strip has a different sampling compound (*i.e.*, different cell type in each strip). (*Id.* at 17-18 (Example III).)

By combining different strips in different combinations, large numbers of unique high density arrays can be produced (*id.* at 2: 8-10; at 4: 7-12). As shown in Fig. 4, "the number of different arrays 32 will be equal to the mathematical combination of the number of different filament types, a far larger number. For example, from a library of 400 standard fibers, 10^{119} different 200 fiber arrays 32 may be created." (*Id.* at 10: 11-13.)

The Examiner's interpretation of claim 41 to mean that the arrays are comprised of different chemically reactive substances, but that the strips may have identical arrays, is at odds with the written description of the claimed invention. The specification clearly requires that the arrays differ from each other in order to be combined to produce "a wide variety" (*id.* at 10: 7) of different arrays that "facilitate the screening of a chemical compound against large numbers of sampling compounds in an efficient and yet flexible way." (*Id.* at 4: 22-25.) This interpretation is consistent with the claim language of "different linear arrays of chemically reactive

substances," rather than "linear array arrays of *different* chemically reactive substances" as the Examiner interprets the claim.

In sum, we interpret "each strip supporting . . . different linear arrays of chemically reactive substances" to mean that the strips differ from each other in having linear arrays that are different in the type and/or order of the chemically reactive substances supported on their surface.

PRIOR ART

Gross teaches test strips for performing medical tests, particularly for analyzing urine (col. 1, ll. 5-9). According to Gross:

> Test strips for determining bilirubin, urobilinogen, ketone bodies, ascorbic acid, glucose, protein, nitrite, the pH and the presence of blood are available for general urine diagnosis. Such test strips contain several test sections on which the reagents associated with the respective test are arranged as indicators. The test strips are moistened with urine and subsequently photometrically analysed.

(Gross at col. 1, ll. 10-17.)

The Examiner states that "[t]here are individual sections along each test strip that provides for a different test reagent that corresponds to each different compound to be determined." (Answer 6.)

DISCUSSION

A prima facie case of obviousness requires evidence that the prior art disclosed or suggested all of the elements of the claimed invention, and that those skilled in the art would have been motivated to combine those elements with a reasonable expectation of success. *See In re Wilson*,

424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970); *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1443 (Fed. Cir. 1991). The Examiner builds the prima facie case of obviousness for all rejected claims on the assertion that Gross teaches a library of strips, each which contains the same array of different chemically reactive substances, meeting the limitation of claim 41 of "strips . . . supporting . . . different linear arrays of chemically reactive substances." However, we have interpreted claim 41 to require that the strips differ from each other in the array, itself, which is exposed on the strip surface. The arrays of chemically reactive substances on the strips must be different from each other. Instead, Gross teaches *identical* linear arrays on each strip (Br. 4-10; Reply Br. 5), not *different* arrays on each strip as required by the claim. None of the other cited references in the rejection are stated by the Examiner to disclose or suggest different arrays on each strip. Consequently, we do not find that all the elements of the claimed invention are disclosed or suggested by the prior art. The rejections of claims 41 and 43-52 are reversed.

OTHER ISSUES

Upon return of the application to the technology center, the Examiner should reconsider the patentability of the claims in view of the proper claim interpretation as set forth *supra* on pp. 3-6. We call the Examiner's attention to the following prior art references not previously of record:

Millstein	PCT Pub. WO99/19711	Apr. 22, 1999
Stimpson	U.S. Pat. No. 6,037,186	Mar. 14, 2000
Noonan	U.S. Pat. No. 6,129,896	Oct. 10, 2000
Kambura	U.S. Pat. No. 6,288,220 B1	Sept. 11, 2001

Stimpson teaches strips supporting linear arrays of different chemically reactive compounds on porous sheet materials. The strips are produced by cutting thin strips from stacks of "spiral wound" porous sheet materials containing longitudinally printed lines of different chemically reactive substances (col. 3, ll. 35-45; col. 5, ll. 9-39; col. 13, ll. 15-34; cols. 15-16 (Example 5); Fig. 2). In certain embodiments, these strips support longitudinal linear arrays of DNA probes on their surface.

The concept of assembling different linear arrays into large two dimensional arrays is described in Kambura. Kambura teaches linear arrays of beads coated with DNA probes (col. 3, ll. 45-53). The beads are arrayed linearly in capillary tubes (col. 8, ll. 15-16). A plurality of the capillary tubes can be assembled to create a two-dimensional probe array in which the capillary arrays are different from each other (col. 4, ll. 10-14; col. 12, ll. 24-33; col. 18 (claim 10)).

The Examiner should determine whether it would have been obvious to have produced different linear arrays using Stimpson's method and to have assembled the different linear arrays into a larger array for the purpose of increasing the number of DNA probes available for screening. The Examiner should consider whether Kambura's teaching that the number of different probes in an array can be increased by combining different linear capillary arrays provides the motivation to have modified Stimpson. Additionally, Millstein teaches assembling a plurality of wafers, each containing 400 array members, into a sub-assembly comprising 30 wafers and 12,000 array members, providing basis for additional motivation

(Millstein at p. 9, ll. 13-20). The Examiner should determine whether Kambura, Millstein, and other relevant prior art establish that it was known in the art at the time the application was filed that high density arrays of many different probes could be constructed by assembling smaller array units.

REVERSED

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